

VI. *Notes on the specific distinction of certain species in the orbitulus and pheretiades section of the genus Plebeius.*
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PLATES VI, VII, VIII.

FOR many years I have felt that the varieties placed in Staudinger's "Catalog" under the two species *orbitulus* and *pheretiades* were not probably in their right positions, but other matters prevented me from settling the question until now.

In October last I was looking up various points connected with the Lycaenidae in the British Museum, when I came across the species *jaloka*, Moore, which was placed as a form of *orbitulus*; a short examination convinced me that it was not a race of that species, and this was confirmed by the genitalia. This incident made me go carefully into all the Eastern forms allied to those species, and has thus enabled me to elucidate various differences that I had previously believed to exist.

My investigations have, I think, proved that *jaloka* and *aegagrus* are not forms of *orbitulus*, but are distinct species, both being nearer to *pheretiades* than to the European species. Dr. Chapman has already shown (Trans. Ent. Soc. 1908, p. 314) that *pyrenaica* is also a distinct species. Staudinger catalogues under *pheretiades* two forms which he calls v. *pheres* and v. *pheretulus*; the genitalia show that whilst *pheretulus* is correctly placed where it is, *pheres*, Stgr. (*nec* Boisduval), is distinct and that it is closest to *jaloka*, Moore.

In the year 1890 Groum-Grshimaïlo ("Romanoff's Memoires," iv, p. 391) suggests the name *phereclus* for a certain race found in the Trans-Alai, retaining *pheretulus* for the Pamir race and giving the name *pherecydes* to Staudinger's *pheres*—a name preoccupied by Boisduval for a North-American species quite distinct from those now under consideration. He supposes that *phereclus* is the primitive form of this small assemblage of allied species, and considers that *dardanus* and *aegagrus* have developed off on the one hand, that *pheres-pheretiades* and *pheretulus*

have been evolved on the other hand, and that the descendants of the latter (*pheretulus*) are *orbitulus aquilo*, *pyrenaica* and *wosnesenskii*.

It appears very much more probable to me that *orbitulus* is the Stirps of this group; the colour is less developed, the sexual dimorphism is less marked, and its dominance in high altitudes (though mere dominance unaccompanied by other points is no sign of primitiveness) makes this species more likely to be the primitive race. Groum-Grshimaïlo says, (*l. c.*) and says rightly, that *pheres*, Stgr. (which hereafter I will call *pherecydes*), is brighter blue, and that *pheretulus* is darker blue, and he goes on to state that in certain of the southern slopes of the Alai Mountains the two forms amalgamate, and that it is impossible to distinguish the one from the other, whilst almost immediately after stating this he proposes the name *phereclus* for the Trans-Alai form. I fear I am quite unable to follow his lead in this particular, and shall treat the name (*phereclus*) as Staudinger has done in his 1901 "Catalog," placing it under *pherecydes*. Neither can I adopt his evolution of the different races: *dardanus* he makes go off directly from *phereclus*, whilst *pyrenaica* he considers is evolved from *orbitulus*, which descends from his suggested primitive *phereclus*. I have no doubt whatever that *dardanus* and *pyrenaica* went off directly on the same line; the one finding a suitable home in the mountains of Asia Minor, the other in the Pyrenees and the mountains of Spain. *Aegagrus* I find by the genitalia to be nearer to *pheretiades*, but the author referred to considers they go off from the Stirps in quite divergent lines.

It will now be well to treat with the forms individually. It is probably unnecessary to say that the whole of these insects are high Alpine species; *orbitulus* is too well known to need reference. The *pheretiades-pherecydes* group is said by the author already quoted not to occur below 9,000 feet and to go up to 10,000 feet. *Aegagrus* occurs only in the high mountains of Persia, and *jaloka* in the mountains of Kashmir, and *ellisi* and *leela* at an elevation of 12,000 and 11,000 feet respectively in the Sanch Pass, Pangî and in Ladak, etc.; of these the three last are without doubt the same species.

Taking them in the order they are placed in in Staudinger's "Catalog," the first form that I make as a good species is—

Plebeius aegagrus, Chr., sp. bon. (Plates VI and VII, figs. 2 on each plate.)

A beautiful species very similar in colour to quite fresh *pyrenaica*, but more transparent; it has a large black spot closing the cell in the primaries and a waved series of postmedian black spots usually, these are occasionally obsolescent, and I have one specimen in which they are absent; below it is of the *pyrenaica* type, only paler. Staudinger, I believe, sent me some of the first specimens that he received of this insect, certainly the first he received when he obtained enough to dispose of, and he wrote me that he considered it a pretty variety of *orbitulus*. I was young in the study of Entomology then, and accepted the dictum of so experienced a collector; my days of lumping species as I did then have gone, and I have for long looked upon this as a good species; time failed me then to examine critically my preparations of the genitalia, and now that I have more to do I have had to make time for their examination. I give at fig. 1, Plate VI, a profile view of *orbitulus*; at fig. 2, a similar view of *aegagrus*, and also the apex of the clasps, in each case showing the teeth, on Plate VII. It will at once be seen that the clasp of *orbitulus* is longer and narrower proportionately, the teeth at the upper apex of *orbitulus* are much further apart and might be likened to the teeth of a large circular saw, whilst those of *aegagrus* are small and even like the teeth of a tenon saw. Again, the fulcrum (the bifid arms arising at the base of the clasp) has a very distinct angle at a third from the apex, which is entirely lacking in *orbitulus*; the tegumen is rather shorter and broader and the falces are slightly shorter also. The aedoeagus of *aegagrus* is rather stouter and less tapering.

The species has only been recorded from Persia, and it might be expected in its isolation to have set up special characteristics as it has done.

Plebeius jaloka, Moore, sp. bon. (Plate VI, fig. 3; Plate VIII, fig. 2.)

The genitalia show perhaps more decidedly than in the preceding species that it is distinct from *orbitulus*.

The suffusion of blue is bright and darker, quite a distinct colour from *orbitulus* and *pheretiades*; it has also a distinct postmedian row of spots in both wings which is never entirely absent; underneath it is often almost white and

of the *pheretiades* type, with a bright blue basal suffusion. In the genitalia the clasps are slightly shorter and also slightly broader than in *orbitulus* or *pheretiades*, whilst the teeth at the apex of the clasps are quite different to either; they are long strong teeth, not mere serrations as in both the species referred to. The falces are slightly more slender, and the aedoeagus is much stouter and quite short, the figure, Pl. VI, f. 3, showing vesica considerably extended.

When examining the specimens in the British Museum it was evident to me that the insect was more nearly allied to *pheretiades* than to *orbitulus*; the pattern and general appearance led to this conclusion in the first instance, whilst subsequent examination of the genitalia confirmed this view. I have no doubt, therefore, that the species is distinct from either, and should come between them.

Referring to *ellisi*, Marshall, and *leela*, de N., I am quite unable to separate these from Moore's species, which is a variable insect. In some specimens there is no discal series of spots, in others there are traces more or less distinct, whilst in the typical form the discal series is specially mentioned. In both Marshall's and de Nicéville's species this series is also distinct. De Nicéville points out in his "Butterflies of India," vol. iii, p. 88, that the three are perhaps at best local races only, and if a larger series could be obtained it might be found that they would be completely connected by intermediate gradations; this has been done, and de Nicéville's surmise has proved correct, hereafter *ellisi* and *leela* must appear as synonyms of *jaloka*.

Plebeius pherecydes, Gr. Gr. (Plate VI, fig. 5; Plate VIII, fig. 3.)

This butterfly was first described by Staudinger as *pheres* as a variety of *pheretiades*, he having overlooked Boisduval's preoccupation of that name; Groum-Grshimaïlo as already mentioned pointed out the oversight and proposed the name I have adopted. The species appears to me to be distinct from Eversmann's insect, and from the genitalia to be more nearly allied to *jaloka*; its position will therefore be between the two. It seems that Groum-Grshimaïlo has confused the local races somewhat. Staudinger is quite explicit in his descriptions and localities; he described from the mountains near Osch the species he called *pheretulus*; this he also received later from his collector in

the Alai Mountains. I have examples from both places and they are alike, and there is no difficulty in separating them from the species from Namangan, which he called *pheres* (*pherecydes*, Gr. Gr.). I have this latter also from Bokhara and a good series from the Pamir; it is quite impossible to separate the specimens from the three localities, but they are all easily separable from the Osch and Alai ones. *Phereclus*, Gr. Gr., will therefore fall as a synonym of *pherecydes*. The species is very close to *pheretiades*, but it can be recognised by the tone of colour being of a more delicate greener blue than that insect, and the dark borders are much narrower; it is very difficult to separate them from the undersides. One character in the genitalia, however, shows strongly the difference between the two; the upper hard chitinous part of the end of the clasp is more elongated, or perhaps the lower soft lobe is shorter in *pherecydes*, whilst the upper apex itself is furnished with long strong teeth as in *jaloka*, the central teeth being the longest. This is a marked and good character in all Plebeids, and I have found it constant. In *pheretiades* these teeth are nothing more than fine very short even serrations. The tegumen also has slight differences, the bifid arms in *pheretiades* are produced upwards so as to form a high saddle rather beyond the middle, descending suddenly rearwards in a sharp short curve and rising slightly again at the hindermost bridge; in *pherecydes* the saddle is not nearly so high, there is very little curve at the back, the hinderpart being little more than an inclined plane; the aedoeagus is shorter than in *pheretiades*, more even in structure and slightly stouter.

Plebeius pheretiades, Ev. (Plate VI, fig. 4; Plate VIII, fig. 1.)

I have already shown the difference in colour between this and the preceding species, these two being the closest so far as colour relation is concerned; the genitalia and the apex of the clasp are figured for comparison.

Plebeius pheretiades pheretulus, Stgr.

In colour it is not difficult to separate this local race from both its parent form and from *pherecydes*; it is very much greyer, almost less blue than the form of *orbitulus* that occurs plentifully about 1,000 feet below the top of

Canigou (in this locality I took last summer the bluest form of *orbitulus* that I have yet seen, and all were of the same colour); the brown borders are decidedly broader and are very indefinite; the black spot closing the cell in the primaries is much smaller, and below there is an almost complete obsolescence of the black pupilled spots of the secondaries. I have no doubt that this is merely a variety of Eversmann's insect, as the genitalia agree entirely with it, and the serrations at the apex of the clasp are precisely as in that species.

Groum-Grshimailo states (*l. c.*) that he has placed all the *pheretiades* from the Pamir in his collection under the name *phetulus*, and presumably the same has been done in the collection of the Grand Duke Nicolas, but I have no doubt whatever that is a mistake. I have not seen this species from the Pamir at all, whilst *pherecydes* is evidently common in that region; the specimens belonging to the former collection are in the British Museum, and those from the Pamir are certainly not *phetulus* but *pherecydes*.

v. tekessana, Alph.

Were it not for the fact that Alphéraky is much too careful a worker to have forgotten Staudinger's description of *phetulus*, I should have thought that this had taken place; he only compares it with *pheretiades*, and I have no doubt whatever that it is *phetulus*. Seven specimens were taken, six males and a female, on the river Tékesse in the Thian-Chan.

Plebeius dis, Gr. Gr.

The type of this species is now in the British Museum; it is a female not a male, as stated in Staudinger's "Catalog," and is entirely blackish-brown with a prominent white spot closing the cell in each wing. Below at the first glance it has a certain resemblance to *pheretes*, Hb., but on further examination it is soon seen that it occupies an intermediate position between the species we have been considering and Hübner's insect; the spots below are white without the black pupils, and occupy positions combining somewhat the characteristics of the two insects just named.

It is a thoroughly good species described originally from Amdo south-east of the Kuku-noor, but it has also recently been received from Thibet; there are at present, I believe, only four specimens known.

Before closing these notes I should like to make a few brief remarks on the species *orbitulus*.

Orbona, Gr. Gr., (1891), Hor. xxv, p. 453.
Syn. *orbitulinus*, Stgr. (1892), Iris, v, p. 318.
.. *oberthuri*, Stgr. (1901), "Catalog," p. 81.

It is curious and interesting to find precisely the same large form of this well-known European species occurring in the Pyrenees, in South-East Siberia, Mongolia and Amdo. I have specimens that if unlabelled and mixed up it would be absolutely impossible to separate out again. Groun-Grshimailo's name has priority, and the other two so far as I am concerned must sink as synonyms to it.

Menetries' form *wosnesenskii* from Kamschatka is described from a ♀; of this I have very little doubt. The form from that region is slightly larger perhaps than European specimens, though it shows very little if any difference when compared with the other Far Eastern and the Pyrenean races; it is very doubtful if the white spots shown in the figure would persist, and, when it is remembered that they do not appear in any of the few males that I have seen from that district, it would seem almost well to discard the name. I am, however, loth to do it on insufficient material, and therefore propose to retain it until more collections come to hand from that somewhat remote region. *Plebeius orbitulus* is a variable species; I have specimens of the ♀ with white dots as in *wosnesenskii* from several districts, and on Mount Canigou (Pyrenees) last summer I obtained many specimens which were also excessively dark.

EXPLANATION OF PLATES VI, VII, VIII.

PLATE VI.

- FIG. 1. *Plebeius orbitulus*.
2. *Plebeius aegagrus*.
3. *Plebeius jaloka*.
4. *Plebeius pheretiades*.
5. *Plebeius pherecydes*.

All magnified $\times 25$.

PLATE VII.

- FIG. 1. *Plebeius orbitulus* (upper apex of clasp showing the teeth).
2. *Plebeius aegagrus* (upper apex of clasp showing the teeth).

Originally magnified $\times 90$, but reduced slightly to bring it within the regulation size of the plate.

PLATE VIII.

- FIG. 1. *Plebeius pheretiades* (upper apex of clasp showing the teeth).
2. *Plebeius jaloka* (upper apex of clasp showing the teeth).
3. *Plebeius pherecydes* (upper apex of clasp showing the teeth).

Fig. 1 was magnified $\times 250$, figs. 2 and 3 $\times 90$, but these have been reduced slightly to bring them within the regulation size of the plate.

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